

What is claimed is:

1. A method for preparing carbon-derived char comprising the steps of:
 - (a) providing a carbonaceous precursor material;
 - (b) lowering the agglomeration value of the carbonaceous precursor material through the addition of inert organic matter;
 - (c) raising the percentage of volatiles in the carbonaceous precursor material to prevent agglomeration and caking;
 - (d) roasting the carbonaceous precursor material in a substantially anaerobic environment; and
 - (e) cooling the resultant solid char.
2. The method of claim 1 further comprising the steps of:
after step d) and before step e)
 - (f) extracting tar gases;
 - (g) filtering the tar gases; and
 - (h) washing the tar gases.
3. The method of claim 1 wherein during step d), the roasting temperature is between about 300 and 700 degrees Celsius.

4. The method of claim 2 wherein during step d), the carbonaceous precursor material is roasted for between about 2 hours and about 4 hours.

5. The method of claim 1 wherein step d) occurs in a multi-hearth roaster with the ability to move a thin layer of material with rotating arms equipped with plow-shaped protrusions.

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6. The method of claim 5 wherein the roaster further includes a plurality of decks constructed of non-corrosive metal with high-heat transfer characteristics, wherein each deck includes floor supports and ceilings formed from thin-shelled reinforced concrete double-wall construction.

7. The method of claim 6 wherein the roaster further includes a number of outside walls and wherein each outside wall has at least one port adapted to provide anaerobic access to the roaster.

8. The method of claim 2 wherein step f) includes the use of injected steam to assist in the removal of the tar and producer gases.

9. The method of claim 1 further comprising the step of after step a) and before step d) adding a carbonate acceptor material to facilitate sulfur removal.

10. The method of claim 1 wherein step e) further includes depositing the resultant solid char in an inverted cone-shaped bin and injecting steam thereinto.

11. A low-emission solid carbonaceous fuel produced by the following process steps:

- a) providing a carbonaceous precursor material;
- b) lowering the agglomeration value of the carbonaceous precursor material through the addition of inert organic matter;
- c) raising the percentage of volatiles in the carbonaceous precursor material prevent agglomeration and caking;
- d) roasting the carbonaceous precursor material in a substantially anaerobic environment; and
- e) cooling the resultant solid char.

12. The method of claim 11 further comprising the steps of:
after step d) and before step e)

- f) extracting tar gases;
- g) filtering the tar gases; and
- h) washing the tar gases.

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13. The method of claim 11 wherein during step d), the roasting temperature is between about 300 and 700 degrees Celsius.

14. The method of claim 12 wherein during step d), the carbonaceous precursor material is roasted for between about 2 hours and about 4 hours.

15. The method of claim 11 wherein step d) occurs in a multi-hearth roaster with the ability to move a thin layer of material with rotating arms equipped with plow-shaped protrusions.

16. The method of claim 15 wherein the roaster further includes a plurality of decks constructed of non-corrosive metal with high-heat transfer characteristics, wherein each deck includes floor supports and ceilings formed from thin-shelled reinforced concrete double-wall construction.

17. The method of claim 16 wherein the roaster further includes a number of outside walls and wherein each outside wall has at least one port adapted to provide anaerobic access to the roaster.

18. The method of claim 12 wherein step f) includes the use of injected steam to assist in the removal of the tar gases.

21. A process for the production of efficiently burning solid char fuel, comprising the steps of:

- a) providing a carbonaceous precursor material including at least one of the following: bituminous coal, coke, lignite, peat, oil shale and tar sands;
- b) adding up to about 20 weight percent of an organic additive to the carbonaceous precursor material to produce a mixture, wherein the organic additive includes at least one of the following: peat, lignite, animal excrement, animal products, vegetable products, paper, waste food, shredded rubber and dry trash;
- c) introducing the mixture into an anaerobic environment maintained at a temperature between about 300 and about 800 degrees Celsius;
- d) agitating the mixture;
- e) roasting the mixture until the mixture is fully charred;
- f) removing the char from the anaerobic environment;
and
- g) cooling the char.